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Reflection on the Future of the Academies of Sciences (**)

The Academies of Sciences were created in the 17th century because of a need for men dedicated to scientific research to meet, to expound and discuss their problems and to make known the results of their work to ever-increasing numbers of people interested in them. Thus, on the initiative of Federico Cesi there was created in Rome in 1603 the Accademia dei Lincei, in London in 1660 the Royal Society inspired primarily by Robert Boyle, and in Paris the Académie des Sciences under the guidance of the farsighted Colbert.

In the 18th century the National Academies of Sciences achieved greater importance and in Russia Lomonosov established the Academy of Sciences of Petersburg, which is today the USSR Academy of Sciences. Every prince in Europe took great pride in his Academy, of which he was the patron and main support. Our founder Anton Maria Lorgna wrote in 1782, "So we see the happy birth of so many illustrious academies which bring fame to France, England, Prussia, Moscow, Sweden and other flourishing states of Europe". In Italy every state had its own academy, but because Italian unity had not yet been achieved there was not a National Academy. And so our Academy was established as the Società Italiana, the Italian Society.

At this point one might question whether the Academies of Sciences are still necessary today and whether they will be more so in the future when data processing will have reduced still further the time required for transmittal of information on scientific findings and contacts among scientists will be always more facilitated by modern systems of communication, or will the academies represent merely a glorious tradition, a necessary phase through which science must pass in its evolution.

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(**) Introduction to the Colloquium on "The Academies of Sciences toward the year 2000" (Rome, 20-22 September 1982). (Translation of the pp. 49-51).

Today the publications of the various academies, often not differing greatly among themselves, do not receive the attention, the importance and the distribution which they deserve. This would lead us to a negative reply to the question, yet some considerations — which I call to your attention for a broad discussion — can point out a new role for the Academies of Sciences in the society of the future.

Academies of Sciences do not generally produce scientific results; therefore they must establish and define their research objectives and interpret the results of scientific research in order to disseminate them on all levels, explaining their significance, their importance and their impact on our society. The Academies can also advise governments when they are requested to do so, but especially they must let the public know their opinion on the great issues which involve science and affect the progress of humanity.

In the past the academies fulfilled the need to promote scientific progress by bringing together scientists of the same country and also of different countries, to provide constructive discussion among them, and to spread the knowledge of their work through periodical publications. In this respect they were an irreplaceable instrument of scientific progress and development. Today these academies are still active, often under regulations which differ very little from the original rules established two or three centuries ago. Because of the many subdivisions in the scientific field and the specialization in the various sectors, their publications have in many cases become outdated and become ends in themselves when their content and form have not been renewed. Membership in this or that academy is sometimes regarded as an honor rather than a duty and an obligation to participate actively for the benefit of science and welfare of humanity.

Today there are also other organizations which have taken on the work done by the early academies: first among these are the National Research Councils, which are state scientific advisory agencies that organize or coordinate research activities and finance them. Then there are organizations which carry on the research, and also the universities, which have always been centers for study and progress, and there are state institutes as well as those of private industry which specialize in research.

Publication is now done through the periodicals of scientific societies or publishing houses which may be organized on an international basis, and these provide effective and prompt propagation of scientific results. Scientific societies also organize meetings to discuss important problems of general interest or of future significance, calling these to the attention of scientists.

The Socialist countries have given a new aspect to the Academies of Science, assigning to them the duties of the Research Councils and adequate structures to carry on research. They constitute an important instrument for programming and carrying on scientific research.

In the developing countries we see another aspect of the academy, which is generally an association of scientists, researchers and university instructors. Its structure is often quite different from that of the Scientific Research Councils

or of the Ministries of Science and Technology, which often have a rigid bureaucratic and administrative structure. Decisions as to development plans even at the teaching level are the function of these bureaucratic organizations, which do not always make the best choices regarding the nation's requirements in various fields, such as investment priorities for industrialization, for agriculture and for education. In this case the opinion of an independent and highly qualified organization such as an Academy of Sciences can call the attention of public opinion and of government authorities to the necessity to correct or modify plans and programs.

In order to modernize themselves some academies have increased the number of their members; others have taken on counseling duties concerning the many problems which continually arise in all fields and which the government must solve.

New models of academies are beginning to develop which combine the promotion of science along the classical lines of meetings and awards with the administration and promotion of research groups all over the world, aiming especially at international cooperation and specific help for developing countries.

In the modern world, in which scientific research is more and more conditioned by economic and bureaucratic factors as well as political pressures, scientists who are members of academies have no frontiers separating them; they can freely concern themselves with the great human problems which confront science: energy, protection of the natural environment, the relationship between man and his environment, the world's food supplies and hunger, fertility of the land, the function of science in a modern world, and finally the moral problems which concern all scientists faced with the possible misuse of their discoveries.

Understanding among scientists through the Academies can constitute an important path toward guaranteeing Peace in the World. From a broader point of view the Academies can be a very efficient instrument for contacts and collaboration among scientists in the various countries, outside the official and bureaucratic channels, and thus produce the indispensable collaboration with the developing countries.

From a broad discussion on these points I am hopeful that there can emerge a guideline for a new function of Science Academies in an evolving society, a line which must naturally bear in mind the traditions and actual conditions of each individual country, and which can show that the scientist and the academies of sciences must devote themselves to the search for truth and progress for the benefit of humanity.